



THE NORTH CAROLINA *Asthma* PLAN
2007 - 2012

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DB's Story

DB is a 13-year-old boy in North Carolina with severe persistent asthma. Case management services were initiated after an inpatient hospitalization due to asthma. At that time, DB was 11 years old and had experienced 10 inpatient admissions and 19 emergency department visits. Two of these inpatient admissions were life-threatening, intensive-care admissions that required mechanical ventilator support. DB's mother reported that he experienced asthma symptoms numerous times daily and never slept through the night without experiencing an asthma exacerbation. His asthma often prevented him from attending school or participating in extracurricular activities. During the 2000-2001 school year, his absences totaled 34 days.

The following are services that the local pediatric asthma program provided and facilitated for DB and his family:

- Numerous home assessments and school and clinic visits to assist in maximizing his asthma management plan;
- Extensive asthma education for DB, his mother, and his teachers;
- Environmental changes to his living environment to mitigate identified barriers to effective asthma control;
- Assistance with transportation arrangements for medical appointments;
- Establishment of a primary care physician to monitor DB's medical care;
- Attendance for DB at asthma camp — his first excursion out of Pitt County; and
- "Adoption" of DB and his mother by a local company at Christmastime.

Many of these interventions involved cooperation and coordination of several agencies or businesses. When extreme heat and the opening of windows were identified as asthma triggers for DB, the local pediatric asthma program worked with the Department of Social Services and a local hardware company to obtaining an air conditioner for his bedroom. Another environmental trigger addressed was an infestation of cockroaches. By working with the housing authority, arrangements were made to have

extermination services provided. Proper cleaning techniques and storage instructions were also addressed in an effort to avoid a re-infestation. The American Lung Association provided financial assistance and transportation so DB could attend asthma camp. And the Christmas "adoption" brought special benefits. After familiarizing themselves with DB's history, employees of a local company expressed their compassion and concern by collecting in excess of \$1,200 in food, gifts, and clothing. DB's favorite gift was an aquarium — because of his allergies, this was his first opportunity to experience the joys of pet ownership.

Through integration of all of these resources in an effort to maximize DB's asthma management, his life has changed drastically. His school absences decreased from 34 during the 2000-2001 school year to 6 in 2001-2002. He has not been to the hospital or emergency department for asthma since case management services were initiated. DB is now active in the local Boys and Girls Club and is participating in karate classes, an endeavor that his asthma would have previously prevented. His mother says, "I never used to sleep at night because I knew DB would have an asthma attack and need me. Now, we both sleep peacefully knowing that we are controlling his asthma instead of it controlling us."

Thanks to Lisa Johnson, Coordinator of Pediatric Asthma Services at Pitt County Memorial Hospital, for sharing this story.

DB's story is quite powerful and inspiring, and it is one of numerous success stories in asthma management and education in North Carolina. We are proud of our approach to asthma management and of the countless individuals and

organizations who are dedicated to improving the lives of those with asthma, but we realize that we have much work left to do.

The North Carolina Asthma Plan that follows provides a comprehensive blueprint for addressing asthma in our state. We will strive to ensure that those individuals with asthma in North Carolina receive the same level of care and peace of mind that DB and his mother received.





**North Carolina Department of Health and Human Services
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From the State Health Director

Asthma is a significant concern for the people of North Carolina. Nearly one million North Carolinians report having ever been diagnosed with asthma, and over 600,000 adults and children in North Carolina are currently living with the disease. Asthma also presents a significant economic burden upon our state each year.

The North Carolina Asthma Plan is a comprehensive document that includes an overview of the burden of asthma in North Carolina; a discussion of the planning process; a strategic plan for addressing asthma; ways for sustaining the plan's initiatives; and an ongoing plan for evaluation and sustainability.

The North Carolina Department of Health and Human Services is committed to carrying out the goals, objectives and priorities outlined in this state asthma plan, thus improving the quality of asthma care and management. North Carolina has a wealth of resources, individuals and organizations committed to reducing the burden of asthma. We look forward to bringing these important resources together for an even more unified effort to addressing asthma in our state.

It is with a great sense of pleasure and accomplishment that we announce and endorse the release of the 2007 North Carolina Asthma Plan.

We trust that the information included in this plan will guide asthma initiatives throughout our state. We invite and encourage all of our colleagues and stakeholders to join the North Carolina Division of Public Health in working to improve the quality of life for those with asthma.

Thank you for your continued support.

Sincerely,

A handwritten signature in black ink that reads "Leah Devlin". The signature is fluid and cursive, with the first name "Leah" being more prominent than the last name "Devlin".

Leah M. Devlin, DDS, MPH
North Carolina State Health Director



From the Co-Chairs of the Asthma Alliance of North Carolina

The Asthma Alliance of North Carolina is pleased to endorse the release of the 2007 North Carolina Asthma Plan.

The Asthma Alliance of North Carolina is a statewide partnership of local and state government agencies, academic institutions, local asthma coalitions, non-profits and private industry working collaboratively to address asthma. The Asthma Alliance's mission is to reduce asthma morbidity and mortality for all people in North Carolina, in partnership with the state health department. We support a comprehensive public health approach that makes use of public and private stakeholder collaborations. We are confident that the North Carolina Asthma Plan will be invaluable to us in carrying out our mission in the coming years.

This plan is the culmination of years of effort on behalf of our statewide coalition. Our members and stakeholders have been passionately involved with the planning process. We are proud of the product, and we are proud to have our ideas, expertise, and support reflected in this important project for our state. We will continue to provide support for the state asthma plan through committees, workgroups and meetings dedicated to the review and evaluation of the plan.

We sincerely thank all those who have devoted their time and resources to this plan and have helped to make its development a great success. We look forward to accomplishing the initiatives set forth in the plan, and we look forward to an even more unified effort to reduce the burden of asthma upon the people of North Carolina.

With highest regard,

A handwritten signature in black ink, appearing to read 'Karin Yeatts'.

Karin Yeatts, PhD
Co-Chair, Asthma Alliance of North Carolina

A handwritten signature in black ink, appearing to read 'Catherine Hathcock'.

Catherine Hathcock, RRT, RCP, AE-C
Co-Chair, Asthma Alliance of North Carolina

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Executive Summary

Introduction

Asthma is one of the most common chronic diseases. It affects the lungs, causing repeated episodes of wheezing, breathlessness, chest tightness, and nighttime or early morning coughing (CDC). In most cases, there is neither a known cause or a known cure for the disease. Asthma may, however, be controlled by proper management, education, and avoidance of certain environmental triggers.

Asthma has significant impact upon many North Carolinians, and it particularly affects women, children, the elderly, certain minority groups, and those with a low socioeconomic status. According to the North Carolina State Center for Health Statistics, in 2005, 10.1% of adults (age 18+) in North Carolina reported ever having been told by a health care provider that they have asthma. Also in 2005, the parents or caregivers of 17.8% of children in North Carolina reported ever having been told by a health care provider that their child has asthma.

A large number of organizations and individuals in North Carolina are committed to asthma care and management. The North Carolina State Asthma Plan can help maximize resource usage among those working to reduce the burden of asthma. It will also be crucial in helping us to identify new resources and opportunities. The plan is based largely on key surveillance findings, as reflected in the *Burden of Asthma in North Carolina* report.

This state plan was collaboratively developed by a number of organizations and individuals who work with asthma initiatives. This effort was coordinated by the North Carolina Asthma Program and the Asthma Alliance of North Carolina (AANC) and was made possible under a planning grant from the Centers for Disease Control and Prevention (CDC).

Goals and Priorities for Addressing Asthma in North Carolina

The ultimate goal of the North Carolina State Asthma Plan is to reduce the burden of asthma upon our state. Prior to the convening of asthma workgroups, the North Carolina Asthma Program developed eighteen key priorities to be addressed by the state asthma plan. These priorities were presented to key asthma stakeholders at an April 2006 facilitated workshop and were subsequently approved by workshop participants. The priorities are listed below (in no particular order):

- Reduce disparities in the asthma mortality rate among racial and ethnic groups;
- Reduce the prevalence of asthma among Native Americans, African Americans, and other disproportionately affected groups;
- Reduce the impact of asthma on women in North Carolina;
- Reduce the prevalence of asthma among those with a low socioeconomic status;
- Reduce asthma mortality for those in the 65+ age bracket;
- Align asthma hospitalization rates in North Carolina with the Healthy People 2010 and Healthy Carolinians goals;
- Decrease the number of emergency room and urgent care visits due to asthma;
- Promote systems change in health care settings to improve the quality of care of people with asthma;
- Increase the number of North Carolina schools with full-time nurses on staff;

- Increase the number of North Carolina schools educating staff about asthma;
- Increase the number of North Carolina schools educating students with asthma about asthma management;
- Increase the number of North Carolina counties with active asthma coalitions or work groups;
- Reduce environmental asthma triggers in public housing settings;
- Work to reduce secondhand smoke exposure;
- Address challenges due to lack of uniformity in school asthma action plans;
- Promote self medication and other asthma or asthma related legislation; and
- Reduce the barriers in access to surveillance data.

From these priorities and from national asthma-related goals and objectives, workgroup members were asked to develop goals and objectives for the following plan category areas: Education and Public Awareness; Environmental; Health Disparities; Medical Management; and Surveillance.



Sections of the Strategic Plan

Education and Public Awareness

Education and Public Awareness are two of the most vital elements of any successful group of asthma interventions and initiatives. Many aspects of Education and Public Awareness emphasize being proactive with asthma care and management, rather than reactive.

Key goals addressed in this section are as follows:

- Increasing asthma education in schools and childcare centers;
- Ensuring that schools are safe and healthy environments for children with asthma;
- Educating North Carolinians about the dangers of secondhand smoke and its relationship to asthma;
- Providing goals for primary care providers and other healthcare professionals that promote standards of care based on guidelines and expectations;
- Developing and promoting a standardized asthma education curriculum; and
- Enhancing community-based asthma coalition and workgroup activities.

Environmental

Addressing and managing asthma requires a strong environmental component. Effective control of environmental components and triggers can have a substantial impact on controlling asthma episodes. North Carolina is fortunate to have a strong foundation of individuals and organizations working on environmental quality issues, such as air quality, healthy homes, asthma-safe construction and environmental outreach, among others.

Goals for addressing asthma from an environmental perspective include:

- Identifying and reducing exposure to indoor asthma triggers;

- Identifying and reducing exposure to outdoor asthma triggers; and
- Exploring correlations between environmental exposure and health impact.

Health Disparities

People from all backgrounds and walks of life are indeed affected by asthma. Key surveillance findings do, however, indicate that certain groups of people are disproportionately affected by asthma in North Carolina. These groups include women, the elderly, certain minority groups, children, and those with a low socioeconomic status.

Goals for addressing and reducing these asthma-related health disparities in North Carolina include:

- Increasing resources for asthma management and services for all underserved populations; and
- Promoting the improvement of economic, social, and physical conditions that contribute to disparities in asthma.

Medical Management

North Carolina has a long history of statewide efforts to improve the quality of care and medical management of children and adults with asthma. Interventions have occurred, and will occur, at the policy, system and practice levels in a variety of agencies, disciplines and settings.

Medical management goals for North Carolina include:

- Promoting the use of best practices, guidelines and data related to the diagnosis and management of asthma;

- Providing individuals with asthma and their families with education, skills and resources to effectively manage their asthma; and
- Working to assure that all individuals with asthma have access to a quality medical home.

Surveillance

Surveillance will play an integral role in North Carolina's success in reducing asthma morbidity and mortality. Surveillance will be used to:

- Aid the North Carolina Asthma Program and its partners in identifying populations at risk for asthma and adverse health effects associated with asthma;
- Continue to monitor these at-risk populations;
- Evaluate the evidence-based interventions to be implemented in North Carolina;
- Obtain quantitative indicators for measuring success of interventions; and
- Identify gaps in existing data sets and sources.

Asthma surveillance in North Carolina will be a fluid process, ever changing and improving to meet the needs of all partners and stakeholders that rely on the data for accurate planning and decision making.

Conclusion and Sustainability

The North Carolina Asthma Plan was written to be a living, working document. The planning and development processes will continue through work in AANC subcommittees, Asthma Project Management Team (a key advisory

committee to the North Carolina Asthma Program) meetings, focus groups throughout the state, and other forums. The plan will be reviewed annually by the state asthma program, the AANC, and other key stakeholder groups to assess the plan's effectiveness and progress toward reaching specified goals and objectives. Potential sources of funding and resources will also be identified. The plan will be formally updated and re-released in approximately five years.



Acronyms

AAE	Association of Asthma Educators
AANC	Asthma Alliance of North Carolina
AARC	American Association for Respiratory Care
ALANC	American Lung Association of North Carolina
BRFSS	Behavioral Risk Factor Surveillance Survey
CCNC	Community Care of North Carolina
CDC	Centers for Disease Control and Prevention
CHAMP	Child Health Assessment and Monitoring Program
GINA	Global Initiative for Asthma
HUD	Department of Housing and Urban Development
IPIP	Improving Performance in Practice
LHA	Local Housing Authority
NAECB	National Asthma Educator Certification Board
NAEPP	National Asthma Education and Prevention Program
NBRC	National Board for Respiratory Care
NC AHEC	North Carolina Area Health Education Centers Program
NC DHHS	North Carolina Department of Health and Human Services
NC DPH	North Carolina Division of Public Health
NC DPI	North Carolina Department of Public Instruction
NC IOM	North Carolina Institute of Medicine
NHLBI	National Heart, Lung, and Blood Institute
NIH	National Institute of Health
NRTC	National Respiratory Training Center
OMH	Office of Minority Health and Health Disparities
WIC	Women, Infants, and Children
YRBS	Youth Risk Behavior Survey

Asthma is a Public Health Priority

Asthma is a public health priority in the United States, as well as here in North Carolina. In the United States in 2002, there were nearly two million asthma-related emergency department visits, as well as 484,000 hospitalizations due to asthma (N.C. State Center for Health Statistics). Although emergency department data is not currently available in North Carolina, in 2002 there were 11,281 asthma hospitalizations in our state. An economic analysis commissioned by the American Lung Association estimated the 2004 annual cost for asthma in the United States at \$16.1 billion (Coffey). Although 2004 numbers for North Carolina are not available, in 2003 in North Carolina, the total estimated cost of asthma exceeded \$631 million (Coffey).

Many factors can reduce the burden of asthma. These factors can include effective control of environmental triggers; availability of quality asthma-related medical care in the community, including access to adequate education on asthma management practices; and community support for the adoption of positive asthma-related policies. Various environmental factors, or triggers, can have a substantial impact upon asthma episodes and attacks. Working to recognize and properly control these triggers can lead to better asthma management and improved quality of life.

A solid medical infrastructure relating to asthma is also necessary to improve the quality of life for persons with asthma. The North Carolina Asthma Program, the Asthma Alliance of North Carolina, and other key partners can work with physicians and health care professionals to ensure that patients receive asthma management plans and comprehensive asthma education, thus potentially reducing emergency room visits and asthma-related hospitalizations.

Access to care is also an issue. While effective asthma management practices do exist, unless people receive proper asthma education from a health care provider, those with asthma and parents of children with asthma are unaware of measures that they can take to reduce the negative effects of their (or their children's) asthma.

Reduced access to care is often associated with lower socioeconomic status and lack of health insurance. These factors, along with failure to recognize the severity of one's condition, can all impact a person's ability to take advantage of proper asthma care.

The development and support of policies to improve the lives of persons living with asthma are very important. Policies now exist that allow children to carry and self-administer asthma medications at school, which is important for avoiding a serious and potentially dangerous asthma exacerbation. Policies that will provide reimbursement to certified asthma educators are currently being studied, not only on the local and state levels but also on the national level. Increasing the number of certified asthma educators in our state increases the chance that a person with asthma and their family will receive appropriate asthma education.

Asthma is one of the most common chronic diseases, and it cannot be cured. However, with understanding of the disease, including knowing what measures can be taken to control triggers of the disease; with a strong medical community knowledgeable about asthma management techniques; with an effort to increase access to appropriate care for all persons with asthma; and with support for policies promoting an improved quality of life for persons with asthma; North Carolina can make significant strides in the fight against the negative effects of asthma.

The Burden of Asthma in North Carolina

Asthma is one of the most prevalent chronic diseases today. Almost 30 million persons in the United States have ever been diagnosed with asthma.¹ In 2005, a need was noted in North Carolina to document the current burden of asthma. This information, which was released in the report, *Burden of Asthma in North Carolina in 2006*, serves two main purposes: 1) to give those who work to reduce the burden of asthma a clear picture of what is going on in North Carolina today, and 2) to provide a baseline from which to evaluate the effectiveness of interventions that will be conducted as part of the State Plan implementation.

The *Burden of Asthma in North Carolina in 2006* (available on the Web at www.asthma.ncdhhs.gov/ncapBurdenReport.htm) examines the current burden of asthma in the state using several different measures, including prevalence, asthma management, quality of life, health care utilization, mortality, and cost of asthma.

Asthma Prevalence

The asthma prevalence for North Carolina was measured through three surveys, the North Carolina Behavioral Risk Factor Surveillance System (N.C. BRFSS), the Childhood Health Assessment and Monitoring Program (N.C. CHAMP), and the North Carolina Youth Risk Behavior Survey (N.C. YRBS). The N.C. BRFSS is population-based, annual, random telephone survey of residents aged 18 and older in households with telephones.² The N.C. CHAMP survey looks at children age 17 and younger, and is conducted as a continuation of the N.C. BRFSS. The children who are selected for the N.C. CHAMP are chosen through a child selection module conducted during the N.C. BRFSS. The N.C. YRBS is a school-based survey conducted by state and local education and health agencies in middle and high schools.³

Asthma prevalence is a measure of the number of persons in the population affected by asthma at a certain time.⁴ Asthma is a difficult disease to quantify in a population, because asthma may appear to resolve itself over time. Although persons who are diagnosed with asthma have the

possibility of being symptom-free for long periods of time, once a person is diagnosed with asthma, it is with them for the rest of their lives.⁵ Therefore, we look at the prevalence of asthma in primarily in two ways, lifetime asthma prevalence and current asthma prevalence.

Lifetime asthma prevalence is defined as an affirmative answer to the question “Have you ever been told by a doctor, nurse, or other health professional that you have asthma?” Current asthma is defined as an affirmative response to the lifetime asthma prevalence question, as well as an affirmative response to the subsequent question “Do you still have asthma?”⁶

Asthma Prevalence Key Findings

Adults

- In 2005, approximately 651,114 adults (age ≥18 years) (10.1% of the population) in North Carolina reported ever having been told by a health care provider that they have asthma. Of those adults in North Carolina, 418,040 (6.5%) reported currently having asthma.⁷
- Adult females in North Carolina are 1.4^a times more likely than adult males to have lifetime asthma, and are 1.79^b times more likely than males to have current asthma.⁷
- North Carolina adults living in households with an income less than \$15,000 are 1.78 times as likely to have lifetime asthma and are 2.14 times as likely to have current asthma as those who live

^aOdds Ratio (an approximation of the rate ratios with rare diseases), 95% Confidence Interval (CI) 1.3-1.6

^bOdds Ratio, 95% CI 1.6-2.1

in households that make more than \$15,000 a year.⁷

Children

- In 2005, 311,118 children (age ≤ 17 years) (17.8% of the population) in North Carolina reported ever having been told by a health care provider that they have asthma. Of those children, 200,549 (11.5%) reported that they still currently have asthma.⁸
- Male children in North Carolina are 1.5^c times as likely to have lifetime asthma as are female children in N.C.⁸
- According to the 2004 National Health Interview Survey (NHIS), the national median for lifetime asthma was 12.2% for children. For current asthma, the national median reported in the 2004 NHIS was 8.5% for children. Although 2004 data are not available for North Carolina children, the 2005 data that are available do suggest that North Carolina's childhood lifetime asthma prevalence (17.8%) and current asthma prevalence (11.5%) greatly exceed the national median.^{8,9}

Asthma Management and Quality of Life

The goal of effective management of asthma is to allow children and adults with asthma to function with minimal restrictions and enjoy a good quality of life throughout their lives. There are several ways to monitor and support management and self-management of asthma. These

include: determining the frequency of episodes of the asthma over time; staging the condition according to daytime and nighttime symptoms and lung function; reporting about quality of health, life and activity limitations by persons and their families; use of school and child care action plans to assist children and students with asthma management; and partnering to reduce environmental triggers in the home, child care facilities, school, work and other settings.¹⁰

Data to measure asthma management and quality of life in North Carolina was obtained from several sources, including the N.C. BRFSS, the N.C. YRBS, and the N.C. CHAMP, as well as the N.C. School Health Education Profile: Principis Survey, and the National Survey on Children's Health.

- Almost 50% of North Carolina adults with current asthma reported experiencing asthma symptoms a minimum of once a week over the past 30 days.⁷ Approximately 20% of those who reported having symptoms a minimum of once a week, reported experiencing asthma symptoms every day during those 30 days.⁷

Asthma Attack or Episode

- Approximately 50% of North Carolina adults with current asthma experienced an asthma attack or episode in the past 12 months.⁷
 - High school females in North Carolina have a higher prevalence of asthma attack (39.5%) than North Carolina high school males (22.6%).¹¹
 - In 2003, half of children with current asthma in North Carolina reportedly had an asthma attack or episode in the previous 12 months.¹²



Missed Activity

- Thirty-two percent of adults in North Carolina with asthma were unable to work or carry out normal activity due to their asthma at least one day during the last 12 months.⁷

^cOdds Ratio, 95% CI 1.3–1.8

- Children with asthma are 37 times more likely to miss school than children without asthma symptoms.¹³
- Of the children in North Carolina with current asthma, almost half (47.5%) missed at least one day of school due to their asthma in the last year. Of that group, 37% of children with asthma missed between one and nine days of school in the past 12 months due to their asthma, and 10% of children with asthma missed 10 or more days due to their asthma.⁸

Health Care Utilization

Asthma health care utilization data includes information on hospitalization and emergency room visits, as well as routine checkups and medication usage which are not shown in this plan but are documented in detail in the *Burden of Asthma in North Carolina 2006* report. This data is currently obtained from three primary sources, the N.C. BRFSS, the N.C. CHAMP, and the State Center for Health Statistics hospital discharge database. The hospital discharge database consists of patient-level information drawn from the billing database on diagnoses, date of admittance and date of discharge, length of stay, information on the patient such as county of residence and gender, patient status at discharge, payer, and total amount billed for the hospital stay. Please note, several types of hospitals are not included in this database, such as military and veteran hospitals, ambulatories, specialty hospitals, rehabilitation facilities, psychiatric facilities and prison hospitals.

Hospitalizations due to asthma often result from uncontrolled asthma. These serious episodes of asthma can generally be prevented with proper treatment and management of the disease. Therefore, hospitalizations due to asthma can be avoided with good asthma management techniques, ongoing education, and support for patients.

- In 2004, females in North Carolina had a significantly higher asthma hospitalization rate (158 per 100,000) than males (92.8 per 100,000).
- In 2004, the highest asthma hospitalization rates in North Carolina occurred in the youngest age group, ages 0-4 years (312.7 per 100,000). The rates then

steadily decreased through middle age and then began increasing again in the 65+ age group to a rate of 210.2 per 100,000.

- In 2004, total charges for hospitalizations in North Carolina for a primary diagnosis of asthma exceeded \$88 million. This represented an average charge of \$8,259 per asthma hospitalization stay.
- A visit to the emergency department because of one's asthma is often an indication of inadequate long-term management of asthma and/or inadequate plans for management of exacerbations.¹⁴
- Almost a quarter (23.6%) of adults with current asthma in North Carolina visited an ER or urgent care center in the 12 months before being surveyed. Of that 23.6%, two-thirds went three or more times.
- Almost 25% of children with current asthma in North Carolina visited the hospital emergency room or urgent care clinic because of their asthma in the 12 months before being surveyed. In North Carolina, African American children were more than twice as likely as white children to have visited the hospital emergency room or urgent care clinic because of their asthma.⁸

Mortality

Deaths due to asthma, while not common, are preventable and represent a breakdown in successful disease management. The national data from 2002 show that 4,261 persons died in the United States that year from a primary cause of asthma, while 110 people in North Carolina died from a primary cause of asthma in that same year.

The most recent data from North Carolina shows that in 2005, 116 people died due to a primary cause of asthma. North Carolina mortality data was obtained from the Detailed Mortality Report that is published by the North Carolina State Center for Health Statistics each year.

- Since 1995, the number of deaths due to a primary cause of asthma has decreased from 180 (a rate of 20.81 deaths per million population) to 116 deaths in 2005 (a rate of 13.57 deaths per million population).
- In North Carolina in 2005, females had a significantly higher mortality rate (17.48 per 1,000,000) due to a primary cause of asthma than males (8.24 per 1,000,000). This data is consistent with previous years.
- Over the previous 6 years (1999-2005), African Americans' mortality rate due to asthma (30.39 deaths per million) was significantly higher than the mortality rate due to asthma for whites (11.21 deaths per million).⁶

Healthy People 2010

Healthy People 2010 presents a comprehensive, nationwide health promotion and disease prevention agenda intended to serve as a roadmap for improving the health of all people in the United States during the first decade of the 21st century. Healthy People 2010 is designed to achieve two overarching goals: 1) increase quality and years of healthy life, and 2) eliminate health disparities. These two goals are supported by specific objectives in 28 focus areas. Each objective was developed with a target to be achieved by the year 2010, including objectives focusing on asthma.¹⁵

Asthma is addressed in the Healthy People 2010 document in section 24, *Respiratory Disease*. There are eight objectives directly related to addressing asthma as a public health problem. These are presented in the following tables, which also show where North Carolina currently stands in meeting each of these goals.

Healthy People 2010: Asthma Mortality

When looking at the entire population of North Carolina in 2005, we appear to be currently reaching the Healthy People 2010 target only in the age group of 65+.

Table 1. Rates (per 1,000,000) of Mortality Due to Asthma versus Healthy People 2010 Goal, North Carolina, 2005

All	Healthy People 2010 Goal Rate (per 1,000,000)	North Carolina 2005 Rate (per 1,000,000)
Age 0 to 4	1.0	3.4
Age 5 to 14	1.0	6.8
Age 15 to 34	2.0	3.7
Age 35 to 64	9.0	12.2
Age 65+	60.0	53.2

Data Source: North Carolina State Center for Health Statistics: Detailed Mortality Statistics, 2005

However, when we examine the data by sex and race, a different picture is seen. In the following table, deaths from the years 1999 through 2005 were combined because of the small number of deaths that occur every year in each sex and racial group.

Table 2. Mortality Due to a Primary Cause of Asthma per 1,000,000 Population versus Healthy People 2010 Goal, by Sex and Race, North Carolina, 1999-2005^{1,2}

	Healthy People 2010 Goal Rate (per 1,000,000)	White Males	White Females	Minority Males	Minority Females
Age 0 to 4	1.0	*	*	*	*
Age 5 to 14	1.0	*	*	7.08	7.26
Age 15 to 34	2.0	2.52	2.96	8.85	8.46
Age 35 to 64	9.0	4.85	12.56	24.9	37.7
Age 65+	60.0	32.85	69.23	103.17	98.6

* <5 but >0 deaths

¹ Asthma death defined as primary cause of death as asthma (ICD-10 J45-J46)

² Minority includes African American, Asian, and American Indian and Alaskan Native

Data Source: North Carolina State Center for Health Statistics: Detailed Mortality Statistics, 2005

When the mortality rates for North Carolinians are examined by sex and race, significant disparities in asthma mortality are seen. Although none of these groups met all of the Healthy People 2010 goals, white males came the closest with those in the 35 and older category meeting their specific goals in their respective age groups. In the age groups where there were more than five deaths, both white and minority females failed to meet the Healthy People 2010 goals, with minority females faring much worse than white females. Minority males had significantly higher mortality rates in each age group than white males and females, and failed to meet the Healthy People 2010 goal in each represented age group.

Disparities due to sex, age, and race will be discussed in more detail later in this section.

Healthy People 2010: Asthma Hospitalization

Hospitalizations due to a primary cause of asthma in North Carolina exceeded the Healthy People 2010 goal in each age group.

Table 3. Hospitalizations with a Primary Cause of Asthma per 100,000 Population versus Healthy People 2010 Goal, North Carolina, 2004^{1,2,3}

All	Healthy People 2010 Goal Rate (per 10,000)	North Carolina 2004 Rate (per 1 0,000)
Age 0 to 4	25	31.3
Age 5 to 64	7.7	9.8
Age 65+	11	21

¹ Only includes primary diagnoses of asthma for North Carolina Residents served in North Carolina hospitals

² Rates may be smaller than actual asthma-related hospital use for counties that border other states

³ 2004 data are provisional

Data Source: North Carolina State Center for Health Statistics, 2004

Healthy Carolinians, North Carolina's 2010 health objectives, set out a comprehensive and ambitious statewide agenda that provides a direction for improving the health and well being of North Carolinians over the next decade. The first of two Healthy Carolinians objectives is to reduce asthma hospitalizations to a target rate of 118 per 100,000, which is an 18% reduction from the 1998 baseline of 143.9 per 100,000 rate.

As of 2004, the rate for persons hospitalized due to asthma was 125.9 per 100,000, which is a 12.5% improvement from the 1998 baseline hospitalization rate.

Healthy People 2010: Asthma Management and Quality of Life

Activity Limitation

The N.C. BRFSS asked adults age 18 and older *“During the past 12 months, how many days were you unable to work or carry out your usual activities because of your asthma?”* The N.C. CHAMP looked at children ages 17 and younger in North Carolina, and asked parents if, *“During the past 12 months, how many days of daycare or school did your child miss due to asthma?”*

The 2005 N.C. BRFSS results show that 32.5% of adults with current asthma responded that they experienced activity limitations because of their asthma. This is well above the Healthy People 2010 target of 10%. The 2005 N.C. CHAMP showed that, of children with current asthma, 47.5% missed at least one day of school in the last year due to their asthma. Healthy People 2010 does not yet have a target for this, as this objective is currently in the developmental phase.

Patient Education

North Carolina data related to this question are currently available only for those North Carolinians age 17 and younger. N.C. CHAMP asks the question *“Has a doctor or other health professional ever given you an asthma management plan for (your child)?”*

While this Healthy People 2010 objective is meant to cover a broader scope than just asthma management plans, asthma management plans are used as part of an overall effort to educate patients in self-management.¹⁸ An individualized asthma management plan should include strategies for identifying and controlling asthma triggers; taking medication(s) as recommended by a health care professional as needed or on a daily basis; monitoring and recognizing early objective and subjective signs and symptoms of an acute episode of asthma or of poorly controlled asthma; and providing a plan for what to do in case of an emergency. The plan should also include contact information for the health care provider and even for a local hospital. An asthma management plan helps the patient and his or her health care provider to establish a course of action for managing asthma.¹⁷ Asthma Management Plans are needed for use in schools and child and adult care facilities and should be provided to patients, families, school staff, and other providers who care for the child or adult.

According to the 2005 N.C. CHAMP, 56.9% of children age 17 and younger with current asthma have been given an asthma management plan by a doctor or other health professional.



Disparities

African Americans, females, the very young, and the very old are all adversely affected by asthma in North Carolina. Females are hospitalized due to asthma more than males, and die from asthma at a significantly greater rate. The very young and the very old are hospitalized due to asthma at a greater rate than other age groups, and the very old die at a much greater rate due to asthma as a primary cause than those who are younger.

Data collected in North Carolina show that African Americans die at a greater rate due to asthma than whites. However, race data is not available for hospitalizations and emergency room visits in North Carolina. National data show that African Americans also visit the emergency room for their asthma at a greater rate than whites. National Hospital Discharge data is available and shows large racial and ethnic disparities. Between 1980 and 1999, national asthma hospitalization rates increased significantly more among black children than among white children. In 1998–1999, the asthma hospitalization rate among black children (569 per 100,000) was 3.6 times the rate for white children (155 per 100,000).¹⁷ According to the National Hospital Discharge Survey, in 2002, the asthma hospitalization rate for all African Americans (360 per 100,000) was 225% higher than the asthma hospitalization rate for all whites (110 per 100,000).¹⁸

Cost of Asthma

Asthma is a significant economic burden at national, state and local levels. An economic analysis commissioned by the American Lung Association estimated the 2004 annual cost for asthma increased to \$16.1 billion from the 2001 estimated annual cost of \$14 billion.^{19, 20}

The 2004 American Lung Association's national estimate examined both direct and indirect costs of asthma. Direct costs included physician visits, hospital stays, and medications. Of the \$16.1 billion total estimate, approximately \$11.5 billion was attributed to direct costs. Prescription drugs represented the largest single direct medical expenditure at \$5 billion.²¹

Indirect costs included but were not limited to lost work days, school absenteeism, loss of productivity, and lost earnings, all of which were estimated to result in \$4.6 billion of the total asthma cost in 2004. This number represented \$1.5 million in lost school days and \$1.4 million in loss of work.¹⁹ However, the largest single indirect cost of asthma was loss of productivity due to death, which was estimated at \$1.7 billion dollars.²¹

The Agency for Healthcare Research and Quality published *Asthma Care Quality Improvement: A Resource Guide for State Action* in 2006. In this document, the economic burden of asthma (including direct and indirect costs) was estimated for each of the fifty states. For North Carolina in 2003, direct costs were estimated at over \$362 million and indirect costs were estimated at more than \$269 million. The total estimated asthma cost for North Carolina for 2003 exceeded \$631 million.¹⁹

The North Carolina State Center for Health Statistics provided information on the amount billed for hospitalization due to a primary cause of asthma for the years 2002 through 2004. Table 4 displays the total cost of hospitalizations for a primary diagnosis of asthma for all ages for each year, as well as cost of hospitalization per individual stay and average length of stay for a primary diagnosis of asthma.

Table 4. Total Charges Hospitalization for a Primary Diagnosis of Asthma^{1,2}, by Average Charges per Stay and Total Hospital Charges per year, 2002 – 2004³

	Total Discharges	Avg. Length of Stay (days)	Total Hospital Charges	Average Charges per Stay
2002	11,280	3.4	\$74,265,930	\$6,584
2003	12,051	3.6	\$90,415,459	\$7,503
2004*	10,753	3.6	\$88,791,995	\$8,259

¹ICD-9 diagnostic codes 493.00 through 493.92

²Data includes only N.C. residents served in N.C. hospitals. Numbers and rates shown may be smaller than the actual hospital use for counties that border other states.

³2004 data provisional

Data Source: North Carolina State Center for Health Statistics, 2002–2004

Conclusion

The burden of asthma in North Carolina is significant. Almost one million North Carolinians have ever been diagnosed with asthma, and over 600,000 adults and children in North Carolina are currently living and dealing with the disease². Significant sex, race, and age disparities demonstrate that targeted interventions among high-risk populations will be necessary so that the program utilizes its resources to the fullest. The North Carolina Asthma Plan presents a comprehensive approach to addressing issues that face these high-risk populations, as well as issues that face all North Carolinians with asthma and those who relate to these individuals. This plan is a significant step in our quest to reduce the burden of asthma in North Carolina.

The Planning Process

Funding from the Centers for Disease Control and Prevention

In September 2004, the North Carolina Asthma Program was awarded funding from the Centers for Disease Control and Prevention (CDC) to accomplish the following: 1) establish a viable program infrastructure; 2) develop a comprehensive state asthma plan that addresses asthma in all ages and ethnic groups and in multiple settings; and 3) enhance existing surveillance systems for asthma to better monitor prevalence, morbidity, mortality, and work-related asthma in North Carolina. The state asthma program infrastructure was established in September 2005, and state asthma program staff began collaborating with the Asthma Alliance of North Carolina (AANC), the Asthma Project Management Team (PMT), and other key partners to begin gathering information and developing the North Carolina Asthma Plan.

The State Plan Facilitated Workshop

The North Carolina Asthma Program sponsored a state asthma plan facilitated workshop in April 2006. Prior to the workshop, the following background and mission statement was developed by the state asthma program for the workshop: “As the burden of asthma continues to be of great concern in North Carolina and nationwide, having a comprehensive state asthma plan with clearly defined priorities is becoming increasingly necessary. People of all backgrounds are affected by asthma, thus a uniform plan for dealing with the disease is in order. This State Plan Facilitated Workshop will allow public health leaders, community representatives, and asthma advocates to collectively identify key priorities, goals, and objectives to facilitate the development of the North Carolina Asthma Plan.”

Prior to the workshop, state asthma program staff developed a list of 18 state plan priorities, based upon key surveillance results included in the *Burden of Asthma in North Carolina* report. This list of priorities was presented and discussed at the workshop, and was subsequently

approved by workshop participants. The finalized North Carolina Asthma Plan priorities are as follows, in no particular order:

- Reduce disparities in the asthma mortality rate among racial and ethnic groups;
- Reduce the prevalence of asthma among Native Americans, African Americans, and other disproportionately affected groups;
- Reduce the impact of asthma on women in North Carolina;
- Reduce the prevalence of asthma among those with a low socioeconomic status;
- Reduce asthma mortality for those in the 65+ age bracket;
- Align asthma hospitalization rates in North Carolina with the Healthy People 2010 and Healthy Carolinians goals;
- Decrease the number of emergency room and urgent care visits due to asthma;
- Promote systems change in health care settings to improve the quality of care of people with asthma;
- Increase the number of North Carolina schools with full-time nurses on staff;
- Increase the number of North Carolina schools educating staff about asthma;
- Increase the number of North Carolina schools educating students with asthma about asthma management;
- Increase the number of North Carolina counties with active asthma coalitions or work groups;
- Reduce environmental asthma triggers in public housing settings;
- Work to reduce second-hand smoke exposure;

- Address challenges due to lack of uniformity in school asthma action plans;
- Promote self-medication and other asthma or asthma-related legislation; and
- Reduce the barriers in access to surveillance data.

The facilitated workshop was organized to allow participants the opportunity to provide input and lend their knowledge to as many areas of the state plan as possible. The workshop featured three rounds of breakout sessions. Participants were randomly assigned to topic areas for their first two sessions. The third and final round of breakouts allowed participants to attend the session around the topic area in which they considered themselves to be an “expert.” The expert panel in each topic area reviewed each goal and objective proposed in the first two rounds and developed a set of goals and objectives to present to the group at large and to the Asthma Alliance of North Carolina. After initial approval by facilitation workshop participants, these goals and objectives became the first draft of our strategic plan. Breakout sessions and expert panel groups were organized into six topic areas:

- Education and Public Awareness
- Environmental
- Health Disparities
- Medical Management
- Policy
- Surveillance

Participants in the facilitated workshop were provided with the *Healthy People 2010* asthma goals, as set forth by the United States Department of Health and Human Services. The goals are as follows:

- Reduce asthma deaths;

- Reduce hospitalizations for asthma;
- Reduce emergency department visits for asthma;
- Reduce activity limitations among persons with asthma;
- Reduce the number of school or work days missed by persons with asthma due to asthma;
- Increase the proportion of persons with asthma who receive formal patient education, including information about community and self-help resources, as an essential part of the management of asthma; and
- Increase the proportion of persons with asthma who receive appropriate asthma care according to the NAEPP (National Asthma Education and Prevention Program) guidelines.

Workgroup participants were asked to consider and include these concepts, along with the aforementioned state plan priorities, as they developed potential goals and objectives for their respective sections.

North Carolina also has its own version of Healthy People 2010, *Healthy Carolinians*. *Healthy Carolinians* emphasizes the following two asthma-related objectives:

- Reduce the rate of asthma related hospitalizations; and
- Reduce the number of school days missed by children with asthma.

In addition to state plan priorities, Healthy People 2010 goals and objectives, and *Healthy Carolinians* objectives, participants in the facilitated workshop were also given a worksheet with the “SMART” (specific, measurable, attainable, relevant, and time-bound) format for developing goals and objectives. This worksheet, along with an accompanying presentation by the state asthma program consultant, guided participants through the process of “making objectives SMART” and questions to ask about the objective/strategy as it is being developed. They were asked to utilize this format when formulating their ideas for particular objectives and strategies.



Follow-up Meetings

The workgroups established at the facilitated workshop, along with other interested stakeholders who joined one or more of the workgroups, met several times following the workshop through AANC subcommittee meetings, Asthma Project Management Team meetings, conference calls, emails, and other personal review meetings with the state asthma program consultant. Goals and objectives were adapted as needed. Strategies were developed for each of the plan's sections, and new versions of the draft were presented to the AANC, AANC subcommittees, Asthma Project Management Team, and other key asthma stakeholders for review.

A final draft of the North Carolina Asthma Plan was presented to the Asthma Alliance of North Carolina (AANC) at their January 2007 quarterly meeting.

Strategic Planning by Local Asthma Coalitions

In conjunction with state planning efforts, the North Carolina Asthma Program has encouraged local asthma coalitions and workgroups to engage in their own strategic planning activities. With the help of CDC funding, the N.C. Asthma Program was able to offer short-term funding to five lead counties across the state in order that they may lead efforts to build coalitions and encourage strategic planning among coalitions in their respective regions. During regional workshops, coalition and workgroup participants were given a suggested template for creating a strategic plan for their coalition activities or enhancing their coalition's existing plan. Upon the completion of these regional workshops, regional coordinators were available to provide technical assistance to each coalition as they progressed in their planning processes. The state asthma program consultant continues to be available for technical assistance as local asthma coalitions and workgroups develop goals and objectives for their respective communities.

Policy Initiatives and the State Plan

Policy was originally included as one of the sections of the state asthma plan, and goals and objectives were developed to be included as part of this section. Upon further review and consideration, the Asthma Project Management Team, Asthma Alliance co-chair, and N.C. Asthma Program staff decided not to have Policy as its own section, but to instead make Policy a priority that should be integrated and prevalent throughout each section of the plan. While many topics are echoed throughout the plan, policy initiatives have been included with each of the five remaining topic areas.

Across the Workgroups

As previously mentioned, the North Carolina Asthma Plan has been divided into the following five sections: Education and Public Awareness; Health Disparities; Medical Management; Surveillance; and Environmental. It is important to note, however, that many crucial concepts and themes are carried throughout the plan and are thus not confined to one particular section. Many of the workgroups, for example, have included asthma action planning, smoke-free policies, public awareness campaigns, asthma educator certification, and the promotion of guidelines and best practices in their goals, objectives, and/or strategies. The workgroups, the N.C. Asthma Program, and the AANC feel that this is very positive, as multiple entities will be working to address asthma-related initiatives from different and valuable perspectives.

Partners and Stakeholders

The North Carolina Asthma Program would like to acknowledge the support and contributions of its many valued partners and stakeholders. In order to create the most comprehensive state plan possible, the support of a wide range of individuals, groups, and organizations was sought and obtained. Those represented in state plan development include asthma education programs, local health department representatives, environmental specialists, nurses, physicians, respiratory therapists, school health professionals, local asthma coalition members, state health department representatives, statisticians, non-profit organizations, and people with asthma, among others.



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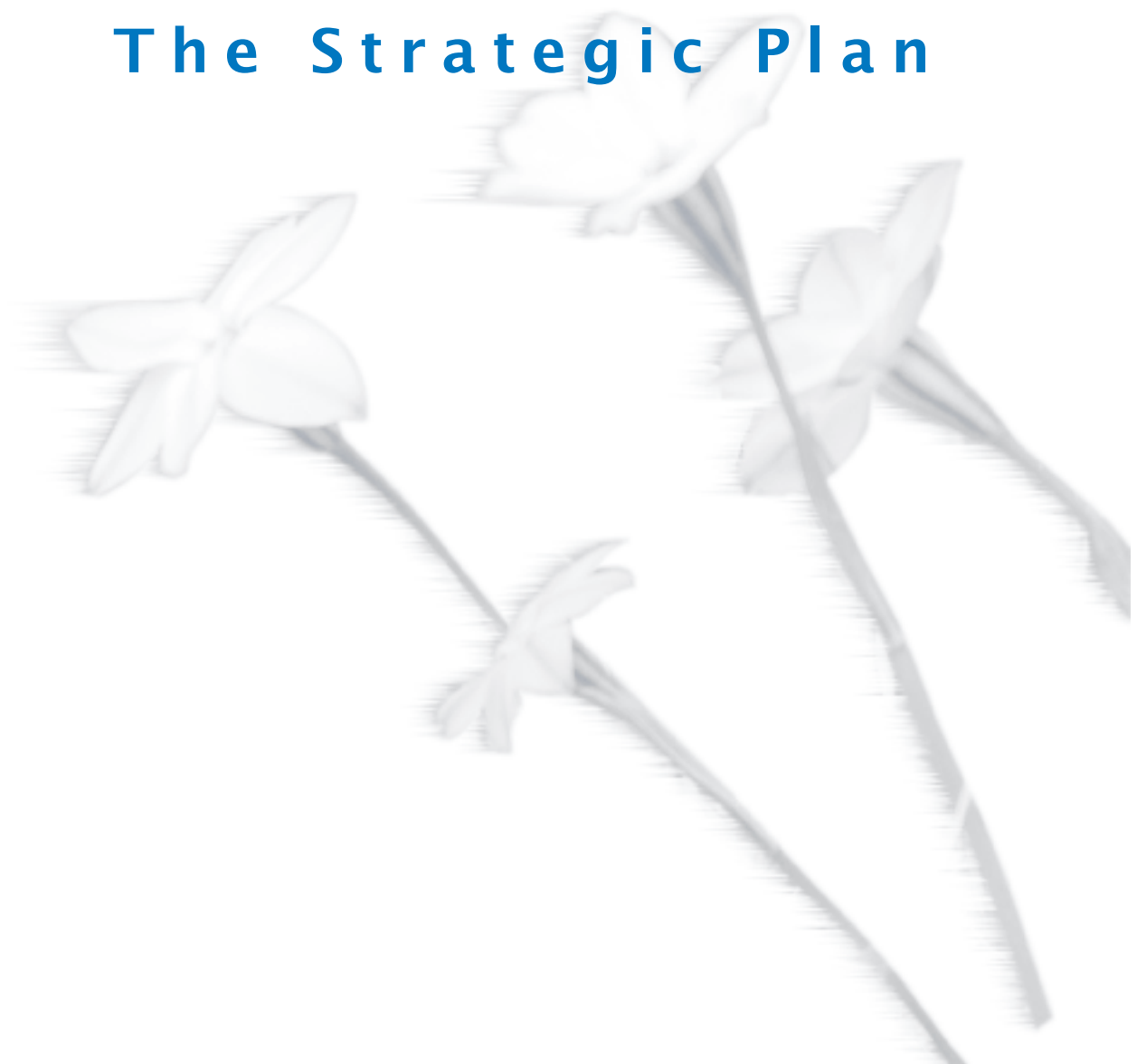
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*The North Carolina Asthma Program would also like to acknowledge the valuable feedback of stakeholders not included in the “contributor and workgroups” section. These stakeholders include, but are not limited to, county coalition workshop participants, Asthma Alliance meeting attendants, and attendees of the State Planning breakout session of the 2006 North Carolina Asthma Summit.

The Strategic Plan



Education and Public Awareness

GOAL 1: Increase asthma education in the school system.

Objectives:

- 1) Through December 2012, promote the North Carolina standard of one school nurse to every 750 students.

Strategies:

- a) Educate stakeholders involved with children and asthma about the current school nurse-to-student ratio in North Carolina.
 - b) Communicate with legislative representatives quarterly regarding students' access to regular asthma management assistance and the current availability of school nurses.
- 2) By July 2009, increase access to schools and childcare centers for approved asthma healthcare providers.

Strategies:

- a) Increase asthma healthcare professional and asthma advocate representation on North Carolina's School Health Advisory Committees (SHACs).
 - b) Partner with local Child Care Health Consultants, as well as Asthma Educators, to assist with education and materials needed in childcare centers.
- 3) By July 2008, increase opportunities for students, staff, coaches, and school health professionals to receive education in asthma management.

Strategies:

- a) Support local asthma coalitions and workgroups in promoting and providing workshops on the "Winning with Asthma" coaches' clipboard project.
- b) Identify existing programs and resources across N.C. that provide education in asthma management, such as the American Lung Association of North Carolina's Open Airways Program, and others.

GOAL 2: Ensure that schools are safe and healthy environments for children with asthma.

Objectives:

- 1) By September 2007, promote the use of a school asthma action plan in N.C. schools that includes education and reporting for staff and students, including plans to minimize asthma triggers.

Strategies:

- a) Convene an action planning subcommittee of AANC members to review existing school asthma action plans.
 - b) Create inventory of existing school asthma action plans in North Carolina. action plan and present to AANC for approval.
 - c) Draft recommendation on a sample school asthma action plan and present to AANC for approval.
 - d) Partner with the Medical Management workgroup to begin promoting sample school asthma action plan through schools, local asthma coalitions, local community groups, and healthcare providers statewide.
- 2) By June 2009, promote the 100% tobacco-free schools initiative.

Strategies:

- a) Collaborate with local asthma coalitions, local tobacco-free coalitions, and Healthy Carolinians partnerships to advocate for tobacco-free schools policies locally.
 - b) Invite speakers and presenters to include smoke-free schools information at asthma-related events (i.e., health fairs, N.C. Asthma Summit).
 - c) Work with the Tobacco Prevention and Control Branch to track the number of schools in North Carolina that go tobacco-free.
- 3) By December 2008, support appropriate in-school use of asthma medications in all N.C. public and private schools.

Strategies:

- a) Educate communities, and promote General Statute 115C-375.2 regarding “possession and self-administration of asthma medication by students with asthma or students subject to anaphylactic reactions, or both.”
- b) Promote the training (by trained school nurses and other healthcare professionals) of school principals in N.C. on the appropriate use of asthma medications in schools.

GOAL 3: Educate North Carolina residents about the dangers of secondhand smoke and its relationship to asthma.

Objectives:

- 1) By March 2010, promote health departments’ implementation of smoke-free dining policies in 50% of North Carolina restaurants.

Strategies:

- a) Collaborate with local asthma coalitions and local tobacco-free coalitions to advocate for smoke-free dining policies locally.

- b) Work with the Tobacco Prevention and Control Branch (NCDPH) to track the number of restaurants in North Carolina that go smoke-free.
- 2) By November 2011, implement a media campaign educating North Carolina residents on the danger of secondhand smoke and its relationship to asthma (emphasis in May during Asthma Awareness Month).

Strategies:

- a) Work with N.C. DHHS Public Affairs to develop a series of public service announcements for state and local media markets.
- b) Pilot media campaign in at least two North Carolina media markets.
- 3) By August 2007, educate the public about *The Health Consequences of Involuntary Exposure to Tobacco Smoke: A Report of the Surgeon General*.

Strategies:

- a) Make this report available through websites, such as the North Carolina Asthma Program, the Asthma Alliance of North Carolina, and the Tobacco Prevention and Control Branch (N.C. Division of Public Health).

GOAL 4: Provide goals for primary care providers and other healthcare professionals that promote standards of care based on guidelines and expectations.

Objectives:

- 1) By May 2008, provide and promote the National Institute of Health and National Heart, Lung, and Blood Institute (NIH/NHLBI) guidelines and/or Global Initiative for Asthma (GINA) guidelines to primary care doctors by December 2007.

Strategy:

- a) Collaborate with the Medical Management work group to identify qualified healthcare professionals as asthma champions. Utilize these asthma champions to promote guidelines within their respective practices.
- 2) By December 2008, encourage professional medical organizations to promote the use of these guidelines.

GOAL 5: Develop and promote a standardized asthma education curriculum for North Carolina health professionals.

Objectives:

- 1) Gain AANC approval of curriculum by May 2009.

Strategies:

- a) Establish a statewide committee to review existing asthma and other public health curricula by December 2007.
 - b) Research existing educational/training resources available in North Carolina for inclusion in the curriculum.
 - c) Draft curriculum in committee and through expert review by February 2009.
 - d) Identify and recruit funding sources to support curriculum development.
- 2) Pilot the curriculum through at least five local health departments and/or health systems by January 2010.
 - 3) Evaluate and collect data on the curriculum for evaluation and revisions by November 2010.

Strategies:

- a) Develop (in committee) a comprehensive evaluation plan for the curriculum.
- 4) Disseminate and promote the curriculum by June 2011.

Strategies:

- a) Develop and hold regional curriculum workshop, trainings, and/or teleconferences.

GOAL 6: Strengthen and support community-based asthma initiatives.

Objectives:

- 1) By December 2010, seek out opportunities for increased funding for evidence-based asthma initiatives by local asthma coalitions or workgroups.

Strategies:

- a) Update the N.C. Asthma Program website to include “funding opportunities” links and resources.
- 2) By July 2008, improve communication among local asthma coalitions and workgroups.

Strategies:

- a) Enhance and re-launch the existing local coalition listserve.
- b) Develop and distribute a biannual asthma coalition newsletter.
- c) Plan and hold annual regional coalition meetings/workshops on topics of interest, including coalition building.
- d) Coordinate and encourage, wherever possible, collaboration on activities and initiatives with other local coalitions, Healthy Carolinians partnerships, North Carolina Cooperative Extension, and others.

- 3) By January 2008, conduct, in conjunction with the North Carolina Asthma Program and the Local Coalitions Committee of the AANC, surveys of local asthma activities.

Strategies:

- a) Design a questionnaire to be distributed to local asthma contact(s) in each county.
- b) Administer the questionnaire to all local coalitions and/or workgroups, and compile results.

Health Disparities

GOAL 1: Increase resources for asthma management and services for all underserved populations.

Objectives:

- 1) By December 2008, partner with asthma coalitions across the state, local asthma representatives, and the Asthma Alliance of North Carolina to develop a resource guide of organizations currently working to increase access to care for underserved populations in our state.

Strategies:

- a) Identify and inventory organizations currently working to increase access to care for underserved populations in North Carolina.
 - b) Disseminate the resource guide to key stakeholders across the state.
- 2) By January 2011, promote culturally appropriate activities among local asthma coalitions, resulting in education/services to all underserved populations in the state.

Strategies:

- a) Pilot cultural competency trainings in at least three local asthma coalitions.
 - b) Survey local coalitions and workgroups on offering workshops on topics of interest relating to educating and serving disparate populations.
 - c) Have coalitions and workgroups share success stories on providing culturally appropriate activities through the local coalitions listserve, AANC activities, and the N.C. Asthma Program website.
- 3) By December 2009, increase the number of minority people with asthma who receive appropriate asthma care and education, including information about community resources and self-help management strategies.

Strategies:

- a) Identify and inventory culturally appropriate educational materials for disparate populations.
 - b) Provide a list of suggested culturally appropriate materials for disparate populations to use in asthma education programs, health departments, physicians' offices, and safety net organizations across the state.
- 4) By March 2011, increase the number of public awareness asthma programs and activities statewide that target disparate populations.

Strategies:

- a) Collaborate with the Division of Public Health, the N.C. Office of Minority Health and Health Disparities (OMHHD) and healthcare professionals to raise awareness, educate, and inform disparate populations on the importance of preventive measures, such as flu shots.
 - b) Collaborate with identified community groups and organizations to develop a public awareness program or campaign appropriate to disparate populations.
- 5) By January 2011, develop a public health campaign, for children and adults with asthma, that addresses health literacy.

Strategies:

- a) Promote the ASK ME 3 campaign, Teach Back Method, and Principle of Clear Health Communication resources to help people understand and process written and oral information about their asthma care (What is my main problem? What do I need to do? Why is it important for me to do this?)
- b) Use the recommendations from the N.C. Institute of Medicine (IOM) Task Force on Health Literacy to inform the campaign.

GOAL 2: Promote the improvement of economic, social, and physical conditions that contribute to disparities in asthma.

Objectives:

- 1) By December 2010, collaborate with the Department of Public Instruction, N.C. DPH, OMHHD, the Department of Environment and Natural Resources, N.C. Cooperative Extension, and other agencies to educate public school employees and child care center personnel regarding conditions that contribute to asthma symptoms.

Strategies:

- a) Pilot at least three train-the-trainer workshops for school and child care center personnel on minimizing conditions that contribute to asthma symptoms.

- 2) By December 2008, support the Department of Public Instruction (DPI) in implementing the Children’s Health Act of 2006 as it relates to asthma triggers, including:
 - Establishing guidelines to reduce students’ exposure to diesel emissions.
 - Studying methods for mold and mildew prevention and mitigation and incorporating recommendations into the public school facilities guidelines.
 - Establishing guidelines for Integrated Pest Management consistent with the policy of the North Carolina School Boards Association, Inc., as published in 2004.
 - Establishing guidelines for notification of parents or guardians, custodians, and school staff of pesticide use on school grounds.
- 3) By January 2010, at least three Asthma Alliance members will serve on the North Carolina Health Access Coalition.

Strategies:

- a) N.C. Health Access Coalition representatives will give yearly report on initiatives and partnership opportunities to AANC.

Medical Management

GOAL 1: Promote the use of best practices, guidelines, and data related to the diagnosis and management of asthma.

Objectives:

- 1) By 2010, increase by 20% persons with asthma who have been seen by a healthcare provider for preventative asthma care in the past year.
- 2) By May 2009, increase public and health care providers’ access to and use of health information, resources, and data about asthma diagnosis and management.

Strategies:

- a) Include information about best practices and guidelines as part of asthma awareness campaigns during Asthma Awareness Month.
- b) Use pre- and post-test knowledge assessments of the general public and providers about best practices and guidelines about diagnosis and management of asthma before and after awareness campaigns.
- c) Educate the public on the medical management of asthma incidents on an ongoing basis.
- d) Encourage coalitions and other asthma groups to compile an inventory of national, state, and local asthma-related health care services, education programs, and other resources available to individuals with asthma related to diagnosis and management. Disseminate this information through the Local Coalition listserve, newsletters, and N.C. Asthma Program web site.

- e) Disseminate, through local pharmacies, information regarding available local asthma education programs and resources.
 - f) Collaborate with N.C. AHEC, the N.C. Pediatric Society, the N.C. Academy of Family Physicians, and other health care provider associations to provide educational programs for health care providers reinforcing the use of NIH and NAEPP guidelines for the diagnosis and medical management of asthma and resources about asthma data.
- 3) By December 2011, increase the number of healthcare offices and clinics that treat people with asthma that have at least one health care professional identified as an “asthma champion.”

Strategies:

- a) Develop an email listserve to incorporate all identified “N.C. asthma champions,” to disseminate information throughout the state on asthma and to serve as a resource for asthma-related information.
- b) Update this listserve as new physician and other health care professional “asthma champions” are identified.

GOAL 2: Provide individuals with asthma and their families with education, skills, and resources to effectively manage their asthma.

Objectives:

- 1) By January 2011, increase the number of individuals diagnosed with asthma who receive written asthma action plans from their healthcare provider.

Strategies:

- a) Work through the AANC Action Planning workgroup to develop a sample school asthma action plan, following the NAEPP guidelines, to be recommended for statewide use.
- b) Present this plan for approval to the AANC.
- c) Promote consistent use of an asthma action plan in schools and through health care providers statewide.
- d) Provide supplemental recommendations to patients and their families regarding activities in which they may participate (i.e., exercise) with some limitation.
- e) Work through the AANC Action Planning workgroup and through local asthma coalitions and other asthma partners to develop a sample asthma action plan, following the NAEPP guidelines, to be recommended for use in child care centers across the state.
- f) Work with health care providers and provider associations to disseminate tools and training materials to help providers teach children, families, and adults how to correctly use a peak flow meter, inhaler, spacer and other devices.

- 2) By January 2012, increase the number of professionals who provide education to people with asthma and their families through the support of the National Asthma Educator Certification Board (NAECB) certification as asthma educators, as well as those who complete nationally recognized asthma educator programs, such as the NRTC, AAE, the NBRC/AARC, and other nationally recognized groups for continuing education.

Strategies:

- a) Identify all North Carolina credentialed asthma educators (AE-C).
 - b) By June 2008, compile an asthma educator resource list to be made available to healthcare providers and patients with asthma.
 - c) Compile a list of accredited asthma educator certification programs.
 - d) Work to increase the number of public and private payers that reimburse for qualified non-physician asthma education.
 - e) Annually, promote and support the Association of Asthma Educators Annual Conference.
- 3) By January 2009, collaborate with the Education and Public Awareness workgroup, the North Carolina Asthma Program, and other key asthma stakeholders to increase public awareness of the impact of second-hand smoke exposure to those with asthma.

Strategies:

- a) Support and assist the American Lung Association of North Carolina (ALANC) in disseminating ongoing education to patients with asthma, schools, day cares, parents, and healthcare professionals.
- b) Work with the Tobacco Prevention and Control Branch to support smoke-free dining, smoke-free school campuses, tobacco-free hospital campuses, and other selected smoke-free policies.
- c) Promote 1-800-QUIT-NOW (1-800-784-8669), the N.C. tobacco use Quitline, to persons with asthma and their family members who smoke.

GOAL 3: Work to assure that all individuals with asthma have access to a quality medical home.

Objectives:

- 1) By June 2010, increase the number of N.C. healthcare providers who treat people with asthma who have a comprehensive understanding of the medical home concept.

Strategies:

- a) Provide N.C. healthcare providers education on the medical home concept and basic quality improvement techniques for working on system changes in their practices or clinics.
- b) Continue to partner with CCNC, IPIP, and other state and local initiatives on strategies for asthma assessment and control.

- 2) By January 2010, promote the medical home concept for medical practices in North Carolina.

Strategies:

- a) Increase the number of primary care providers who have done a self-assessment of their practice's medical home initiatives.
- b) Through January 2012, encourage primary care providers to develop action steps to improve one or more aspects of the medical home concept in their practices.

Surveillance

GOAL 1: Identify and monitor populations at risk for asthma in North Carolina.

Objectives:

- 1) Beginning in June 2007, utilize burden report to identify and communicate information to constituents on who is most at risk for asthma.

Strategy:

- a) According to the *Burden of Asthma in North Carolina*, 2006 high-risk populations include: children (especially those on Medicaid), African Americans, and females. Target information to these groups of people.
- 2) By March 2011, work to determine which disparities are due to asthma management gaps and which are a true representation of high-risk populations.

Strategies:

- a) Partner with the Medical Management and Education and Public Awareness committees to promote the use of asthma management plans.
- b) Devise and conduct survey(s) on utilization of asthma management plans in health care systems and programs.
- 3) By December 2008, enhance systems for monitoring county-level data.

Strategies:

- a) Begin to report to the public on asthma-related emergency department visits by county.
- b) Meet with surveillance work group advisors to develop a report format and determine whether to release this report once or twice per year.
- 4) By January 2008, assess existing datasets to ensure compliance with all confidentiality reporting requirements.

Strategy:

- a) Review confidentiality requirements and datasets annually.

GOAL 2: Assess the surveillance needs of asthma stakeholders in North Carolina.

Objectives:

- 1) By June 2008, create an inventory of currently available asthma surveillance resources.

Strategies:

- a) Establish a work group consisting of partners with expertise in data and surveillance to determine the best available sources of asthma data in North Carolina.
 - b) Update the Matrix of Data Sources in North Carolina (developed in March 2006) quarterly.
 - c) Make the Matrix of Data Sources available through the N.C. Asthma Program's web site and through local asthma representatives.
- 2) By December 2008, conduct a data needs assessment with key asthma stakeholders and communities.

Strategies:

- a) Design an assessment instrument and develop list of key targeted stakeholders and community representatives.
 - b) Analyze results of the needs assessment, and target the areas of highest priority.
 - c) Report results to community asthma representatives.
- 3) By December 2008, identify any gaps in existing North Carolina asthma data.

Strategies:

- a) Identify data and resources needed to fill existing data gaps.
 - b) Identify potential sources of funding for enhancements to asthma surveillance.
 - c) Promote the addition of asthma-related questions to N.C. survey instruments (such as BRFSS, CHAMP, YRBS, School Health Survey, etc.), where applicable.
- 4) By June 2008, convene bi-annual surveillance advisory task force to review and target asthma surveillance needs across North Carolina.

Strategies:

- a) Develop a list of potential task force members.
- b) Convene the first meeting of the surveillance advisory task force.
- c) When available, review the results of the data needs assessment, and target surveillance activities based upon the results.

GOAL 3: Disseminate asthma surveillance data to appropriate populations and organizations to influence policy and drive interventions, education, and behavior.

Objectives:

- 1) Beginning in late spring 2007, distribute the first bi-annual surveillance update newsletter to asthma stakeholders across North Carolina.

Strategies:

- a) Identify surveillance topics of interest for the newsletter.
 - b) Identify target audiences for the newsletter.
 - c) Develop or identify email listserve of key partners and audiences for distribution of the newsletter.
- 2) Beginning in December 2006, issue an updated version of *Burden of Asthma in North Carolina* report every three years.

Strategies:

- a) Identify data necessary for each report, and identify organizations and sources of obtaining the necessary data.
- b) Utilize a committee to review drafts, and report content and data sources for the report.
- c) Prepare summary sheets both for legislative representatives and the general public.

Environmental

GOAL 1: Identify and reduce exposure to indoor asthma triggers.

Objectives:

- 1) Beginning in 2007, partner with stakeholders with an interest in identifying and reducing asthma triggers, including representatives from the following sectors: families, health, housing, education, and the legal community.
- 2) By January 2011, educate asthma stakeholders about indoor asthma triggers, through messages tailored to specific audiences, using the following media:
 - Internet
 - Local and state agency outreach resources
 - Educational materials appropriate to all education levels
 - Radio, TV and print public service messaging
 - Continuing education for housing and health professionals

Strategies:

- a) Update the Asthma Alliance website to include resources on managing indoor asthma triggers.

- b) Provide links on indoor asthma triggers that may be downloaded to local coalition homepages.
 - c) Identify links to other websites that appropriately address indoor asthma triggers, such as N.C. Air Aware, CDC Asthma Management, and N.C. HealthyBuilt Homes and schools.
 - d) Develop for download local and targeted press releases, messages, and talking points.
 - e) Develop speaker and topic lists for presentations and trainings relating to indoor air quality.
- 3) Beginning in 2007, review existing regulations and codes addressing indoor asthma triggers for a yearly report to the Asthma Alliance of North Carolina (AANC).

Strategies:

- a) Partner with Legal Aid of North Carolina to have law interns research building codes/regulations and housing codes/regulations that promote “asthma-safe” buildings (as defined by the ALA Healthy House Standard, EPA/DOE Energy Star Indoor Air Quality specifications, and N.C. HealthyBuilt Home criteria).
 - b) Partner with the N.C. Department of Insurance, Building Code Council to promote awareness of “asthma safe” construction.
 - c) Partner with the N.C. Department of Public Instruction (NCDPI) to promote awareness of “asthma-safe” construction and remediation in schools.
- 4) By April 2010, promote policies supporting the identification and elimination of asthma triggers in Section 8 and public housing units.

Strategies:

- a) Partner with HUD and Local Housing Authorities (LHAs) to promote “asthma safe” properties to be qualified to participate in Housing Assistance Programs (Section 8, for example).
- b) Partner with agencies, such as HealthyBuilt Homes and schools and the Office of Economic Development, to promote “asthma-safe” new construction and remediation, for example HealthyBuilt Homes and schools and the Office of Economic Development.
- c) Encourage LHAs to withhold Housing Assistance payments from property owners who fail to maintain rental properties in “asthma-safe” condition.
- d) Develop and implement an education and outreach program for LHA administrators on the importance of identifying and managing asthma triggers in rental assistance properties.
- e) Develop and implement an education and training program for inspection staff at LHAs to recognize asthma triggers in the properties they inspect.
- f) Develop and implement education and training programs, including printed materials, for tenants on measures that can be used to manage asthma in their homes, including training on proper cleaning methods.

- 5) By March 2011, promote the updating of existing regulations and codes addressing indoor asthma triggers where appropriate, according to a consensus vote from the AANC.

Strategies:

- a) Identify jurisdictions (cities and counties) without local minimum housing codes, and encourage those jurisdictions to enact appropriate housing codes.
- b) Partner with the N.C. Building Code Council to promote “asthma-safe” construction.
- c) Partner with North Carolina Councils of Government to encourage local jurisdictions to adopt minimum housing ordinances.
- d) Draft model minimum housing codes and encourage jurisdictions to adopt and enforce them.

GOAL 2: Identify and reduce exposure to outdoor asthma triggers.

Objectives:

- 1) By January 2011, educate asthma stakeholders about outdoor asthma triggers using the following media:
 - Internet
 - Local and state agency outreach resources
 - Educational materials appropriate to all education levels
 - Radio, TV, and print public service messaging
 - Continuing education for housing and health professionals

Strategies:

- a) Update the Asthma Alliance website to include resources on managing outdoor asthma triggers.
 - b) Provide links on outdoor asthma triggers that can be downloaded onto local coalition homepages.
 - c) Identify and manage links to other websites that appropriately address outdoor air quality, such as the N.C. Division of Air Quality and the EPA.
 - d) Develop for download local and targeted press releases, messages, and talking points.
 - e) Develop and maintain speaker and topic list for presentations and trainings relating to outdoor air quality.
- 2) By January 2010, promote awareness of alternative actions to air pollution that may contribute to asthma:
 - Encourage mass transit options.
 - Support policies that encourage walkable (smart growth) communities.
 - Support policies that encourage alternate fuel technology.
 - Promote awareness about the negative health effects of open burning.

Strategy:

- a) Partner with the Division of Air Quality to promote mass transit, smart growth, alternative fuels, and open burning awareness.
- 3) By March 2011, promote awareness of the air quality index.

Strategies:

- a) Display educational posters/fliers in childcare centers, possibly with color wheel, web address to find air quality status, etc.
- b) Partner with N.C. Cooperative Extension, N.C. Division of Child Development, N.C. Division of Air Quality, and/or Children's Environmental Health Branch to distribute appropriate educational materials on the air quality index to child care centers.
- c) Partner with the Division of Air Quality and local news outlets across N.C. to include air quality information/warnings during weather segments.

GOAL 3: Explore correlations between environmental exposure and health impact.

Objectives:

- 1) By January 2009, identify and review scientific research studies relevant to the mission of the AANC.

Strategies:

- a) Partner with collegiate health programs to have students research and develop initial list of studies.
- b) Encourage members of AANC to forward information (articles, links, etc.) to a designated member of the Environmental Committee for distribution and archiving.
- 2) Beginning in August 2008, create and report summaries of scientific research studies biannually to the AANC.

Strategies:

- a) Designate the Environmental Committee to review summaries and present annual report to the AANC.
- b) Place report on the NC Asthma Program's website.
- 3) By December 2008, promote the inclusion of scientific research in asthma prevention efforts statewide.

Strategy:

- a) Collaborate with other AANC committees to ensure the inclusion of scientific research in their efforts to address asthma.
- 4) By February 2009, promote enhancement of communication and dissemination between researchers and stakeholders.

Strategies:

- a) Place list of researched resources (as identified under objective 1) on the Asthma Alliance website.
- b) Maintain updated list of research studies on Asthma Alliance website.
- c) Develop web method for interested parties to send inquiries to the Environmental committee.



How We Will Sustain North Carolina's Asthma Initiatives

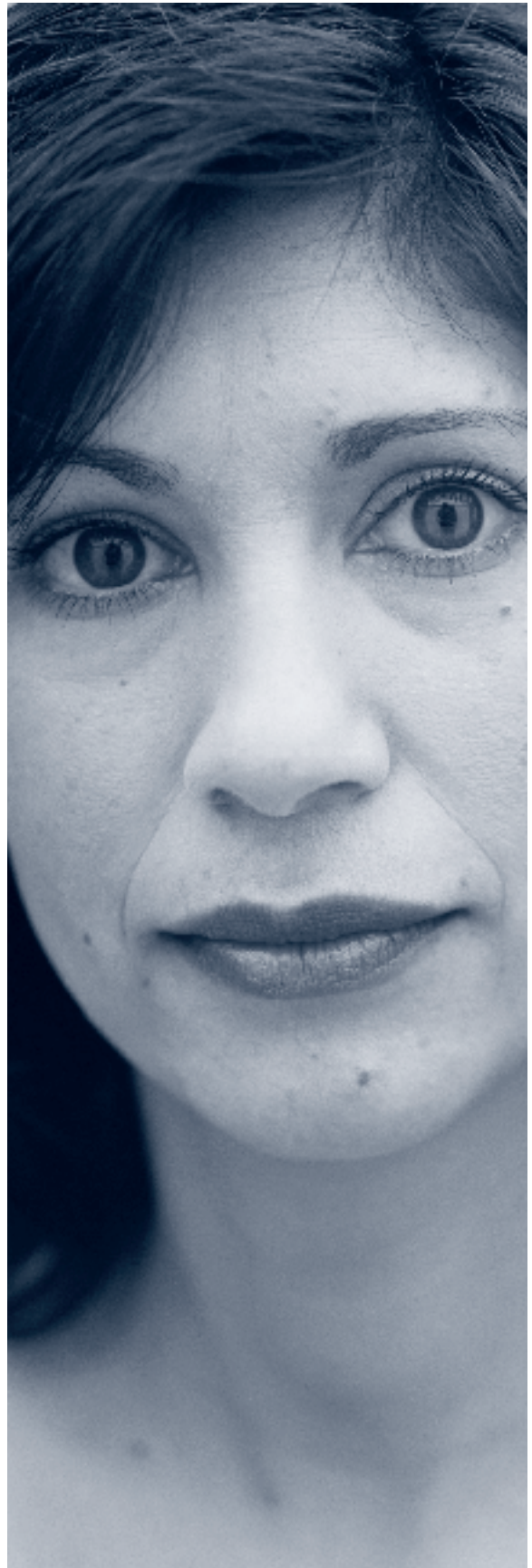
The North Carolina Asthma Plan was written as, and is intended to be, a living, working document.

The Asthma Alliance of North Carolina (AANC) meets quarterly to address the need for and effectiveness of asthma initiatives across our state. This statewide coalition represents individuals and organizations committed to reducing the burden of asthma in North Carolina. New members are continuously being recruited and are encouraged to become involved with this mutually beneficial opportunity. At least one AANC meeting yearly will be devoted to the review and evaluation of progress toward meeting the goals and objectives of the state plan. The plan will be updated and re-released every three to five years.

North Carolina's recent efforts to build and strengthen local asthma coalitions across our state reinforce our commitment to partnerships and collaboration. Nearly half of North Carolina counties have formed, or are in the process of forming, local asthma coalitions or workgroups. With the support of the state asthma program, many of these groups are developing their own strategic plans for addressing asthma in their respective communities.

Finally, the North Carolina Asthma Program is absolutely committed to sustaining the efforts put into the development of this plan. The program, which was under-staffed and in the developmental stages until 2005, now has a firmly established infrastructure capable of providing top-level leadership on all concepts set forth in the plan.

North Carolina is very fortunate to have a wealth of asthma human resources available. Each of the goals and objectives included in this plan was collaboratively set, and North Carolina has every reason to anticipate that each of the goals and objectives in this plan will be collaboratively achieved, built upon, and sustained over time.



Evaluation Plan

In order to ensure that the North Carolina Asthma Plan is working and serving the purposes that its drafters intended, a comprehensive evaluation framework has been designed. The North Carolina Asthma Program, in collaboration with the Asthma Alliance of North Carolina, the Asthma Project Management Team, and other key stakeholders across the state, will conduct ongoing evaluations to assess the qualitative and quantitative success of the North Carolina Asthma Plan. Our evaluation plan demonstrates outcome/output indicators related to addressing asthma and working to reduce the burden of asthma in our state.

To facilitate the evaluation process, the North Carolina Asthma Plan authors developed objectives and strategies with the “SMART” format in mind. Participants in our April 2006 facilitated workshop were provided these guidelines to help participants in making the objectives and strategies specific, measurable, attainable, relevant, and time-bound. Including these aspects of the “SMART” format whenever possible will allow for more comprehensive evaluation.

Our evaluation process will follow many of the steps included in CDC’s *Framework for Program Evaluation in Public Health* and will incorporate other evaluation strategies relevant to activities and initiatives in North Carolina.

First, stakeholders will play an integral role in what we learn and apply from our evaluation process. Our partners and stakeholders are key to the success of the North Carolina Asthma Plan, and gaining their buy-in has been critical. The Asthma Alliance of North Carolina (AANC), our largest stakeholder group and statewide coalition, will devote one of their meetings each year to reviewing progress toward reaching the goals, objectives, and strategies set forth in the plan. AANC subcommittee chairs will be particularly instrumental in taking lead roles in helping to evaluate their particular sections of the plan. These individuals, along with other committee members, will work with the N.C. Asthma Program Consultant and Coordinator to track progress toward the completion of

initiatives outlined within their respective workgroup sections. They will also work to restructure and/or revisit the goals, objectives and strategies in their sections, when necessary.

The Asthma Project Management Team (PMT), advisory team to the N.C. Asthma Program, will also devote one of their semi-monthly meetings each year to reviewing progress toward reaching the goals, objectives and strategies set forth in the plan. At each meeting of both the AANC and the PMT, the Asthma Program Consultant or Coordinator will give a progress report on plan initiatives.

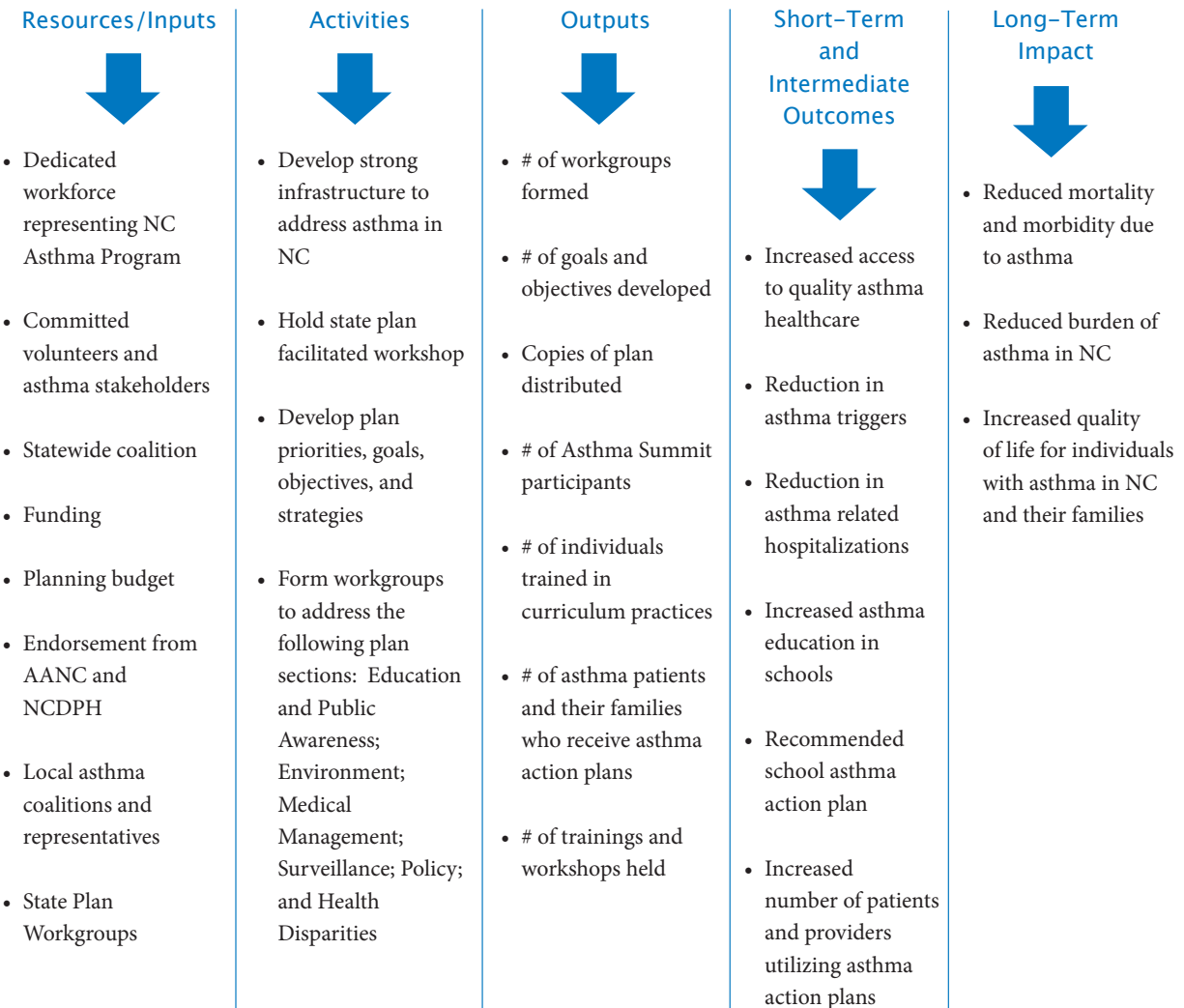
Local Asthma Coalitions will also be targeted for input. These are the representatives who will be implementing the day-to-day aspects of the state plan. The Asthma Program Consultant and Coordinator will conduct personal interviews and group meetings, on both local and regional bases, to discover how evaluation techniques and the plan itself can be best structured to meet the specific needs of coalitions.

In addition to yearly reviews of this plan by the entities named above and other stakeholders, a framework for the next North Carolina Asthma Plan will be established, and the next plan will be released within five years.

Upon the release of the North Carolina Asthma Plan, an electronic evaluation tool will be posted on the North Carolina Asthma Program’s website for completion by constituents and stakeholders who view the plan online. Also, as funding permits, the same evaluation form will be mailed out, either with printed copies of the plan

or a short time after the plan is mailed. Results will be compiled by the Asthma Program Statistician and will be used to make necessary adjustments and improvements to plan activities.

Second, a logic model has been found to be a reasonable tool for clarifying the focus and direction of this initiative. It's quite helpful to pictorially display and summarize the steps leading to the plan's desired outcomes. The logic model for the North Carolina Asthma Plan is as follows:



Evaluation (continued)

This evaluation section has been included in the plan as a protocol for establishing clear and appropriate plan evaluation procedures. Just as plan goals, objectives, strategies, etc. will be adjusted if needed following review, this evaluation strategy will be revised if critical circumstances change.

Furthermore, North Carolina Asthma Program staff will continue to poll key stakeholders, including the AANC, on how to best utilize evaluation findings, and we will subsequently tailor evaluation techniques to what will be most beneficial for our colleagues and stakeholders.

Some specific topic areas that will be addressed with our initial evaluation surveys are:

- The type of organization that the stakeholder(s) represents;
- How the stakeholder(s) plans to use the state plan;
- Partners that the stakeholder(s) plans to involve;
- Rating of the usefulness of each section;
- Content that the stakeholder(s) would like to see in future editions of the plan; and
- Other individuals or organizations that they believe would benefit from the plan.

A follow-up evaluation survey of state plan-related initiatives will address the following:

- Partners and stakeholders who have been targeted;
- Additional partners and stakeholders that we hope to reach with plan activities;
- Progress toward meeting timelines;
- Detailed accomplishments in implementing plan activities;
- If a particular objective or strategy has not been reached, why; and
- Plans for addressing the remainder of the plan initiatives.

This follow-up survey will be collectively developed by N.C. Asthma Program staff, AANC committees, and the Asthma Project Management Team during the first year of plan implementation, and it will be administered to key targeted stakeholders and partners upon the completion of the first year of the North Carolina Asthma Plan.

The following techniques and strategies will also be used for gathering evidence on the plan's effectiveness:

- Gathering success stories and challenges relating to plan activities;
- Tracking plan activities through activity forms, logs, participant lists, and minutes; and
- Surveys and personal interviews (as previously mentioned).

We also recognize the importance of communicating the results of our plan evaluation to our stakeholders and community representatives. Doing so will help us to ensure that the needs of these persons and the citizens of North Carolina are being adequately met.

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